WHAT IS CLAIMED IS:

1.   A method for controlling an industrial process, the method comprising;

        outputting a plurality of parameters from a process for manufacture of a substance;

        using each of the plurality of parameters in a computer aided process, the computer aided process comparing at least two of the plurality of parameters against a training set of parameters, the training set of parameters being predetermined;

        determining if the at least two of the plurality of parameters are within a predetermined range of the training set of parameters; and

        outputting a result based upon the determining step.

2.   The method of claim 1 wherein the substance is selected from a petroleum product, a chemical product, a food product, a health product, a cleaning product, a biological product, and other fluid or objects.

3.   The method of claim 1 wherein the plurality of parameters are selected from an intrinsic element or an extrinsic element of the process.

4.   The method of claim 1 wherein the using, determining, and outputting are provided in a computer software program.

5.   The method of claim 1 wherein the computer aided process includes an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV, SIMCA Prd, Canon Prd, SCREAM, and Fisher CV.

6.   The method of claim 1 further comprising normalizing each of the plurality of parameters before the using step.

7.   The method of claim 1 further comprising adjusting a base line of each of the plurality of parameters before the using step.

8.   The method of claim 1 wherein the result is an affirmative response or a negative response, where the response is displayed on a terminal.

1   9.   The method of claim 1 wherein the computer aided process is
2 selected from a library comprising a plurality of processes for performing the comparing
3 step.

1   10.   The method of claim 9 wherein the plurality of processes includes
2 at least a comparing process, a contrasting process, and a functional process.

1   11.   A method for monitoring an industrial process for the manufacture
2 of materials, the method comprising:
3   inputting a plurality of process parameters from a process for manufacture
4 of a substance;
5   selecting one of a plurality of computer aided processes, each of the
6 computer aided processes being capable of determining an output based upon a training
7 set of the plurality of process parameters;
8   using each of the plurality of parameters in the selected computer aided
9 process, the selected computer aided process comparing at least two of the plurality of
10 process parameters against a training set of parameters;
11   determining if the at least two of the plurality of process parameters are
12 within a predetermined range of the training set of parameters; and
13   outputting a result based upon the determining step.

1   12.   The method of claim 11 wherein the substance is selected from a
2 petroleum product, a chemical product, a food product, a health product, a cleaning
3 product, a biological product, and other fluid or objects.

1   13.   The method of claim 11 wherein the plurality of process
2 parameters are selected from an intrinsic element or an extrinsic element of the process.

1   14.   The method of claim 11 wherein the using, determining, and
2 outputting are provided in a computer software program.

1   15.   The method of claim 11 wherein the computer aided process
2 includes an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV,
3 SIMCA Prd, Canon Prd, SCREAM, and Fisher CV.

1   16.   The method of claim 11 further comprising normalizing each of
2   the plurality of parameters before the using step.

1   17.   The method of claim 11 further comprising adjusting a base line of
2   each of the plurality of parameters before the using step.

1   18.   The method of claim 11 wherein the result is an affirmative
2   response or a negative response, where the response is displayed on a terminal.

1   19.   The method of claim 11 wherein the computer aided process is
2   selected from a library comprising a plurality of processes for performing the comparing
3   step.

1   20.   The method of claim 19 wherein the plurality of processes includes
2   at least a comparing process, a contrasting process, and a functional process.

1   21.   A method for identifying a mode of operation in an industrial
2   process, the method comprising:
3   running an industrial process, the industrial process being characterized by
4   a plurality of parameters at an in-process state of a substance or object being
5   manufactured, each of the parameters defining a characteristic of the substance or the
6   object in the in-process state;
7   converting each of the parameters into an electronic form;
8   inputting each of the plurality of parameters through a preprocessing
9   method to increase a signal to noise ratio of one or more of the plurality of parameters,
10 the preprocessing method being preselected based upon a training set of parameters that
11 improved the signal to noise ration of the one or more parameters;
12   processing the preprocessed parameters through a computer aided process
13 to form a descriptor from the preprocessed parameters, the computer aided process being
14 selected from a plurality of computer aided processes based upon a training set of
15 parameters;
16   determining if the descriptor is within a selected class from a plurality of
17 classes; and
18   outputting a result based upon the determining step.

1   22.   A method for determining an acceptability of a process, the method
2   comprising:
3   identifying a plurality of process parameters from a process for
4   manufacture of a substance;
5   using one of the selected computer aided processes out of a plurality of
6   computer aided processes, the selected computer aided process being derived from a
7   training set of the plurality of process parameters;
8   determining an acceptability of the process using each of the plurality of
9   parameters in the selected computer aided process, the selected computer aided process
10   comparing at least two of the plurality of process parameters against a training set of
11   parameters; and
12   outputting a result based upon the acceptability of the process.

1   23.   A method for monitoring a process, the method comprising:
2   storing a first model in a memory;
3   acquiring data from a process;
4   applying the first model to the data to identify a first predicted descriptor
5   characteristic of a state of the process; and
6   consulting a first knowledge based system to provide an output based upon
7   the first predicted descriptor.

1   24.   The method of claim 23 wherein the model is constructed from a
2   mathematical equation describing a physical law.

1   25.   The method of claim 23 further comprising preprocessing the data
2   prior to applying the model.

1   26.   The method of claim 23 wherein the output is communicated to
2   control the process by adjusting an operational parameter of the process.

1   27.   The method of claim 23 wherein the output is communicated to a
2   human operator to permit monitoring of the process.

1   28.   The method of claim 23 wherein the output is resident on a server
2   and accessible to a user through a browser software program.

1   29.   The method of claim 28 wherein the input is acquired from the

2 process over a network of computers

1   30.   The method of claim 23 wherein the input is acquired from the

2 process over a network of computers..

1   31.   The method of claim 23 wherein the output is communicated over

2 a network to an associated system, the associated system including at least one of a legacy

3 system, an e-enterprise system, and a desktop application.

1   32.   The method of claim 23 wherein the first knowledge based system

2 is an expert system.

1   33.   The method of claim 23 further comprising:

2   acquiring initial data from a source at a first time;

3   converting the initial data into electronic form;

4   loading the initial data into memory;

5   retrieving the initial data from memory;

6   acquiring subsequent data from the source at a second time;

7   assigning a first descriptor to the initial data and a second descriptor to the

8 subsequent data;

9   constructing the model based upon the initial data, the subsequent data, the

10 first descriptor, and the second descriptor; and

11   storing the model in memory.

1   34.   The method of claim 33 wherein the model is constructed from one

2 of a univariate statistical technique, a multivariate statistical technique, a neural-based

3 approach, and a time series analysis.

1   35.   The method of claim 33 wherein the model is constructed from one

2 of a group of different algorithms stored in a library.

1   36.   The method of claim 33 wherein the source is in communication

2 with the process, the initial data and the subsequent data reflecting prior operation of the

3 process.

1   37.   The method of claim 33 wherein the source is in communication

2   with a second process similar to the process, the initial data and the subsequent data

3   reflecting operation of the second process.

1   38.   The method of claim 33 further comprising:

2   constructing a second model;

3   storing the second model in memory;

4   applying the second model to the process data to identify a second

5   predicted descriptor characteristic of the process data; and

6   consulting the first knowledge based system to produce the output based

7   upon the first predicted descriptor and the second predicted descriptor.

1   39.   The method of claim 38 wherein the second model is constructed

2   based upon the initial data, the subsequent data, the first descriptor, and the second

3   descriptor, such that comparison of the first descriptor and the second descriptor

4   represents a cross-validation.

1   40.   The method of claim 38 wherein the second model is constructed

2   from operation of a second process similar to the process, such that comparison of the

3   first descriptor to the second descriptor represents an external validation..

1   41.   The method of claim 38 wherein the knowledge based system is an

2   expert system.

1   42.   The method of claim 38 wherein a difference between the first

2   predicted descriptor and the second predicted descriptor is resolved by a second expert

3   system.

1   43.   The method claim 23 further comprising receiving key preliminary

2   information and communicating the key preliminary information downstream to the first

3   model, such that the first predicted descriptor reflects the key preliminary information.